[THESE ARE THE ANSWERS TO THE EXAM QUESTIONS, AS PRODUCED BY CHATGPT]

Question 1.

A. Using the Rothchild-Stiglitz framework, describe the types of equilibria that can occur in insurance markets where consumers have heterogeneous risk types, under different assumptions about the insurer's knowledge of individuals' risk types. Feel free to use graphical illustration or mathematical exposition to help answer the question, but be sure to explain the intuition of your answer in words.

B. Suppose an insurer adopted a managed care technique like prior authorization to control utilization. How would that sort of technique get incorporated into the Rothchild-Stiglitz framework, and why?

C. A regulator can take a number of actions to help reduce adverse selection. Discuss one example of such a regulatory action. Describe how that action intends to reduce adverse selection, the strengths and weakness of that action with respect to reducing adverse selection, and any empirical evidence on the effects of that sort of action.

A. Rothschild-Stiglitz Equilibrium in Insurance Markets

The Rothschild-Stiglitz (R-S) model is a seminal framework for understanding equilibrium in insurance markets where consumers have heterogeneous risk types—typically classified as high-risk and low-risk individuals. The key feature of this model is that individuals know their own risk type, but insurers do not, leading to asymmetric information.

Types of Equilibria

1. **Separating Equilibrium:**
    - **Assumptions:** In this equilibrium, insurers can offer a menu of insurance contracts, where high-risk individuals and low-risk individuals select different contracts. The insurer designs these contracts to ensure that each risk type self-selects into the appropriate contract.
    - **Contract Characteristics:** Typically, the high-risk individuals select a contract with full coverage but at a higher premium, while low-risk individuals select a contract with partial coverage but at a lower premium. This design relies on the fact that low-risk individuals are less likely to value full coverage due to their lower probability of a loss.
    - **Intuition:** The intuition behind this equilibrium is that the insurer sets up the contracts in such a way that it is not beneficial for low-risk individuals to choose the contract designed for high-risk individuals because the cost (premium) outweighs the benefit (full coverage).

- **Graphical Illustration:** In a graph with insurance coverage on the x-axis and utility on the y-axis, the indifference curves for high-risk individuals are steeper because they value insurance more. The separating contracts are tangential to the indifference curve of each risk type, ensuring that each chooses the contract intended for them.

2. **Pooling Equilibrium:**
   - **Assumptions:** Under certain conditions, it might be possible for a pooling equilibrium to exist where both high-risk and low-risk individuals buy the same insurance contract. This occurs if the insurer cannot design a contract that successfully separates the two risk types or if the risk of adverse selection is too high.
   - **Contract Characteristics:** In a pooling equilibrium, the contract offered typically provides a level of coverage that is a compromise between the optimal coverage levels for high-risk and low-risk individuals. The premium is set at a level that reflects the average risk in the pool.
   - **Intuition:** The pooling equilibrium is less efficient than the separating equilibrium because it fails to match coverage levels with individuals' true risk. This inefficiency can lead to some market participants (usually low-risk individuals) being underinsured or dropping out of the market entirely.
   - **Graphical Illustration:** In this scenario, the single contract lies on a point where the insurer's expected profit equals zero for the average risk in the pool.
3. **No Equilibrium:**
   - **Assumptions:** In some cases, neither separating nor pooling equilibria can exist, leading to market failure. This typically happens when the incentives for low-risk individuals to mimic high-risk individuals are too strong, or when the costs associated with separating contracts are too high for the insurer.
   - **Intuition:** In the absence of a feasible equilibrium, the market may break down due to adverse selection, where only the high-risk individuals remain in the market, driving premiums up to unsustainable levels, which in turn drives low-risk individuals out of the market.
   - **Mathematical Exposition:** The utility functions and the insurer's profit functions do not intersect in a way that allows for an equilibrium, leading to a situation where no contract can satisfy both the insurer and the insured.

B. Incorporating Managed Care Techniques into the Rothschild-Stiglitz Framework

Managed care techniques like prior authorization can be incorporated into the R-S framework as a tool for influencing the cost of claims, effectively altering the utility functions of the insured individuals.

1. **Mechanism:** Prior authorization requires individuals to obtain approval before accessing certain healthcare services. This mechanism can reduce moral hazard by limiting unnecessary or overly expensive treatments, thereby lowering the insurer's expected cost.
2. **Impact on Equilibria:**
   - **Separating Equilibrium:** In a separating equilibrium, prior authorization could be included in the contracts targeted at high-risk individuals, who are more likely

to require such services. By doing so, the insurer can further differentiate between high-risk and low-risk individuals, potentially leading to more refined separating contracts.
    - **Pooling Equilibrium:** In a pooling scenario, prior authorization could be applied uniformly to the pooled contract. This may reduce the average cost of claims, allowing the insurer to offer a more affordable premium that could retain low-risk individuals in the market.
    - **No Equilibrium:** If prior authorization is perceived as too restrictive or costly in terms of convenience, it might exacerbate adverse selection by driving away low-risk individuals who are less likely to need intensive healthcare services. This could further destabilize the market.
3. **Intuition:** The introduction of managed care techniques like prior authorization can be seen as a way to control utilization and manage the insurer's risk. By limiting access to certain services, these techniques can lower the overall cost of claims, which can help in maintaining an equilibrium or preventing market failure.

C. Regulatory Action to Reduce Adverse Selection: Mandated Coverage

One example of a regulatory action designed to reduce adverse selection is the implementation of mandated coverage, where regulators require individuals to purchase insurance or face penalties.

1. **Objective:** Mandated coverage aims to ensure that low-risk individuals remain in the insurance pool, thereby preventing adverse selection. By mandating participation, the regulator ensures a broader risk pool, which helps stabilize premiums and allows insurers to offer more favorable terms.
2. **Strengths:**
    - **Risk Pooling:** Mandated coverage helps maintain a more balanced risk pool by preventing the exit of low-risk individuals. This broad participation helps to keep premiums affordable for everyone.
    - **Market Stability:** By ensuring that both high-risk and low-risk individuals remain in the market, mandated coverage can reduce the likelihood of a market collapse due to adverse selection.
3. **Weaknesses:**
    - **Compliance and Enforcement:** The effectiveness of mandated coverage depends on the enforcement mechanism. If penalties for non-compliance are weak or difficult to enforce, the policy may fail to achieve its objective.
    - **Equity Concerns:** Mandated coverage can be seen as inequitable, especially if low-income individuals are required to purchase insurance that they may not be able to afford, even with subsidies.
4. **Empirical Evidence:** The introduction of the individual mandate under the Affordable Care Act (ACA) in the United States serves as a real-world example. Studies have shown that the mandate helped increase insurance coverage rates and stabilize premiums. However, the repeal of the mandate's penalties in 2019 led to concerns about rising premiums and the potential for adverse selection to re-emerge in the market.

Question 3.

There are many market failures in health care and health insurance.

A. Identify three market failures that lead to large costs in terms of economic inefficiency. In two or three paragraphs for each, explain the nature of the market failure. Your answer should make the case that the welfare costs of the market failure are high, using both theoretical arguments and empirical evidence.

B. Select one of the market failures. What public policies would effectively address this market failure? As in part (a), cite existing evidence to argue that the policy would be effective at improving economic efficiency. Please note that you may not "re-use" the answer to Question 1, Part C in this answer (i.e., you must select different examples of public policies).

1. **Adverse Selection:**
    - **Nature of the Market Failure:** Adverse selection arises in health insurance markets when individuals have better information about their own health risks than insurers do. This information asymmetry leads to a situation where those who are at higher risk of needing medical care are more likely to purchase health insurance, while healthier individuals opt out or choose minimal coverage. As a result, the risk pool becomes skewed towards high-risk individuals, leading insurers to raise premiums to cover the higher average cost of claims. This increase in premiums can cause even more healthy individuals to exit the market, potentially leading to a "death spiral" where the market becomes unsustainable.
    - **Welfare Costs:** The welfare costs of adverse selection are significant, as the inefficient allocation of insurance results in underinsurance or uninsured individuals, leading to poor health outcomes and financial insecurity. Empirical evidence from studies on the U.S. health insurance market before the implementation of the Affordable Care Act (ACA) shows that adverse selection led to higher premiums and a smaller, sicker insurance pool. The introduction of the ACA's individual mandate aimed to mitigate these effects by requiring everyone to purchase insurance, which increased coverage rates and stabilized premiums, highlighting the high welfare costs of unaddressed adverse selection.
2. **Moral Hazard:**
    - **Nature of the Market Failure:** Moral hazard occurs when individuals change their behavior after obtaining insurance, becoming more likely to consume healthcare services because they do not bear the full cost of their actions. This overutilization of healthcare resources leads to economic inefficiency, as resources are diverted to low-value or unnecessary care, driving up overall healthcare costs. Moral hazard is particularly pronounced in health insurance markets because of the complex nature of healthcare decision-making and the difficulty in assessing the value of services provided.
    - **Welfare Costs:** The welfare costs associated with moral hazard are substantial. The overconsumption of healthcare services not only increases costs but also leads to the misallocation of resources, reducing the overall efficiency of the

healthcare system. Studies have shown that when individuals face lower out-of-pocket costs for healthcare services, utilization increases significantly, even for services of marginal benefit. For example, the RAND Health Insurance Experiment, a landmark study, demonstrated that individuals with comprehensive health insurance used more healthcare services than those with higher cost-sharing, without a corresponding improvement in health outcomes. This evidence underscores the economic inefficiency generated by moral hazard.

3. **Monopoly Power in Healthcare Provision:**
    - **Nature of the Market Failure:** Monopoly power in healthcare markets arises when providers, such as hospitals or pharmaceutical companies, have significant market power, allowing them to set prices above competitive levels. This market failure is often due to barriers to entry, the unique nature of healthcare services, and the inelastic demand for healthcare. As a result, consumers face higher prices for healthcare services and products, leading to economic inefficiency as consumer surplus is transferred to producers, and overall welfare is reduced.
    - **Welfare Costs:** The welfare costs of monopoly power in healthcare are considerable. High prices reduce access to necessary medical services and increase out-of-pocket costs for consumers, leading to reduced consumption of healthcare and poorer health outcomes. Empirical evidence supports this, as studies have shown that regions with higher levels of provider consolidation (e.g., hospital mergers) experience significant price increases without corresponding improvements in the quality of care. For instance, a study published in *Health Affairs* found that hospital consolidation led to price increases of up to 20%, with no evidence of improved patient outcomes. This evidence highlights the significant economic inefficiency caused by monopoly power in healthcare markets.

B. Addressing Monopoly Power in Healthcare Provision

To address the market failure of monopoly power in healthcare provision, public policies that promote competition and regulate prices are essential. One effective policy approach is the implementation of **antitrust enforcement and price regulation**.

- **Antitrust Enforcement:** Antitrust laws can be used to prevent or break up monopolistic practices in healthcare markets. By scrutinizing mergers and acquisitions that reduce competition, regulators can maintain a competitive market structure, which helps keep prices in check and improves consumer welfare. For example, the Federal Trade Commission (FTC) in the United States has actively challenged hospital mergers that it deems to be anti-competitive. Research has shown that such interventions can prevent significant price increases that would have resulted from reduced competition. A study by the FTC found that blocking anti-competitive mergers in the hospital industry helped to preserve competition and keep prices lower for consumers.
- **Price Regulation:** In markets where competition cannot be easily restored, such as in cases where there are natural monopolies or essential drugs, price regulation can be an effective tool. Governments can set price caps or negotiate prices with providers to prevent excessive pricing. For instance, the German healthcare system uses a form of

price regulation for pharmaceuticals, where drug prices are negotiated between insurers and manufacturers. Studies have shown that this approach keeps drug prices lower than in countries without such regulation, without negatively impacting innovation or the availability of medications. This evidence suggests that price regulation can effectively reduce the welfare costs associated with monopoly power.

The combination of antitrust enforcement and price regulation addresses the market failure by promoting competition where possible and controlling prices where necessary. These policies help reduce the economic inefficiencies caused by monopoly power, ensuring that healthcare services remain accessible and affordable for consumers, thereby improving overall welfare.

Question 4.

"Global capitation" has emerged as a model of health care payment in recent years, where primary care organizations (for example, Oak Street Health and ChenMed) receive prospective risk-adjusted per-patient monthly payments, primarily from private Medicare Advantage plans. In return, the primary care organizations are financially responsible for all health care used by patients choosing to receive care from the organization (including hospital or emergency department care).

a. How do you predict that global capitation would affect the quantity of services provided to patients by primary care physicians relative to fee-for-service reimbursement? Under what circumstances would the level of services in global capitation fall below what is socially optimal for patient health?

b. Discuss two potential problems that could arise from unconstrained competition between primary care organizations under global capitation. What are regulations that could prevent these problems?

c. A hypothetical empirical analysis compared health service use among Medicare beneficiaries enrolled in global capitation compared to Medicare beneficiaries whose primary care providers received fee-for-service payment, controlling for observed patient health status. The analysis found lower overall health service use for global capitation patients and the authors concluded that global capitation reduced health care costs. Do you agree with this conclusion?

A. Predicting the Impact of Global Capitation on Service Provision

Effect on Quantity of Services: Global capitation, where primary care organizations receive fixed, risk-adjusted payments per patient, is fundamentally different from fee-for-service (FFS) reimbursement, which compensates providers based on the quantity of services rendered. Under global capitation, primary care physicians have an incentive to provide care more efficiently because they benefit financially from reducing unnecessary services. This contrasts with FFS, where providers have a financial incentive to increase the volume of services, as more services directly translate into higher revenue.

In a global capitation model, primary care physicians are likely to focus on preventive care and managing chronic conditions to avoid costly interventions like hospitalizations. This shift could lead to a more judicious use of healthcare resources, with an emphasis on outcomes rather than volume. However, this model also presents a risk of under-provision of services, particularly if the capitation payments are not adequately risk-adjusted or if the payment levels are set too low.

Circumstances Leading to Suboptimal Service Levels: The level of services under global capitation could fall below what is socially optimal for patient health if:

1. **Inadequate Risk Adjustment:** If the capitation payments do not sufficiently account for the health status of patients, primary care organizations may be incentivized to reduce the quantity or intensity of services to maintain profitability, potentially compromising patient care.
2. **Excessive Cost-Cutting Pressures:** Organizations may seek to maximize their financial margins by cutting costs excessively, leading to under-provision of necessary services. This could happen if there are insufficient safeguards to ensure that patients receive appropriate care or if quality measures are not effectively enforced.
3. **Patient Selection (Cream Skimming):** If primary care organizations are able to selectively enroll healthier patients (cream skimming) while avoiding sicker, more expensive patients, the overall level of service provision could be reduced, leading to inequities in care and potentially worse health outcomes for the sickest patients.

B. Potential Problems from Unconstrained Competition in Global Capitation

1. **Risk of Cream Skimming:**
    - **Problem:** In an environment of unconstrained competition, primary care organizations may engage in cream skimming, where they focus on attracting healthier, lower-cost patients while avoiding sicker, higher-cost ones. This practice could lead to a bifurcated market where high-risk patients face reduced access to care or are left with fewer provider options, ultimately exacerbating disparities in healthcare.
    - **Regulation:** To prevent cream skimming, regulators could enforce stricter risk adjustment methodologies that more accurately reflect the health status of enrollees, ensuring that organizations are fairly compensated for caring for sicker patients. Additionally, implementing minimum quality standards and monitoring outcomes for high-risk populations could discourage organizations from selectively enrolling healthier patients.
2. **Quality Deterioration:**
    - **Problem:** Another potential issue is that fierce competition could lead to cost-cutting measures that undermine the quality of care. Primary care organizations may reduce staffing levels, shorten consultation times, or cut back on necessary services to stay financially viable in a competitive market, leading to poorer patient outcomes.
    - **Regulation:** To mitigate this risk, regulators could establish mandatory quality benchmarks that organizations must meet to participate in the capitation program. These benchmarks could include patient satisfaction scores, preventive care metrics, and outcome-based measures. Additionally, periodic audits and inspections could ensure compliance with quality standards.

C. Assessing the Conclusion that Global Capitation Reduces Health Care Costs

Interpretation of the Findings: The hypothetical empirical analysis found lower overall health service use among Medicare beneficiaries enrolled in global capitation compared to those in FFS, controlling for patient health status. The authors concluded that global capitation reduced healthcare costs.

While it is plausible that global capitation leads to lower healthcare costs due to a reduction in unnecessary services, this conclusion requires a nuanced interpretation:

1. **Cost Reduction vs. Underutilization:** The observed reduction in service use could indicate that global capitation encourages more efficient care, reducing unnecessary tests, procedures, and hospitalizations. However, it is also possible that the reduction in service use reflects underutilization, where necessary care is being withheld to save costs. This would be particularly concerning if the reduction in services disproportionately affects vulnerable populations or leads to worse health outcomes in the long term.
2. **Quality of Care Consideration:** Lower service use does not necessarily equate to improved efficiency if it compromises the quality of care. Without accompanying data on health outcomes, patient satisfaction, or long-term health costs, it is difficult to fully endorse the conclusion that global capitation reduces costs in a way that is beneficial for patients. For instance, if reduced service use leads to higher rates of hospitalization or more severe health issues in the future, the short-term cost savings could be offset by long-term health costs.
3. **Further Evidence Needed:** To robustly conclude that global capitation reduces healthcare costs, it would be essential to analyze the impact on health outcomes, patient satisfaction, and the overall trajectory of healthcare expenditures. Comparative studies that include both short-term and long-term effects, as well as potential unintended consequences like increased emergency room visits or hospitalizations, would provide a clearer picture.